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MADROÑO

A WEST AMERICAN JOURNAL OF BOTANY

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SOME NEW LAURENCIAE FROM SOUTHERN CALIFORNIA

ELMER YALE DAWSON

For many years the genus *Laurencia* has been troublesome for collectors of algae along the California coast because of an unwillingness among specialists to tackle the difficulties of the genus and to name the various entities found in the region. Consequently these algae have received only vague designation under names of species mostly of European habitat. In southern California the very distinctive *Laurencia subopposita* has long been the only species clearly understood (3, p. 221, pl. 15, fig. b). The species now known as *L. pacifica* (2, p. 42, fig. 38) was designated under a number of misnomers until very recent years. Of the three species described here, *L. diegoensis* has gone under the name of the more northern *L. spectabilis*. *L. Maxineae* and *L. scrippensis* seem to be poorly represented in collections, and rarely named at all. The species from the vicinity of La Jolla generally designated as *L. papillosa* is another plant in need of further study. It does not occur, however, during the fall or winter seasons, and an examination of a good series of specimens has not been possible up to the time of this writing.

Acknowledgements are due to Dr. H. L. Mason of the Herbarium of the University of California for the loan of specimens, and to Dr. C. K. Tseng for helpful suggestions during the course of this study.

Laurencia Maxineae is named for my wife who aided in the collection and study of these plants; *L. scrippensis*, for the Scripps Institution of Oceanography near which the specimens were first discovered; and *L. diegoensis*, for San Diego County, the shores of which it inhabits.

The type specimens are deposited in the Herbarium of the University of California, Berkeley.

***Laurencia Maxineae* sp. nov.** Thalli 3–6 cm. alti, fusco-rubri; surculis erectis compressis, bipinnatis et cum ramis in uno plano orientibus; axibus principibus 1.5 mm. latis, 200–350 μ crassis; cellulis superficialibus cubicis, 20–25 μ diam.; cellulis medularibus 50–60 μ diam., sine tumoribus lenticularibus; ramulis spermatacialibus ovatis, 1 vel 2 cornutis; tetrasporangiis simplicibus, in ramulis ultimis, sine nodosis lateralibus; cystocarpiis ovatis.

Thalli 3–6 cm. tall, reddish-brown, flexible, delicate; erect shoots one to a few from a small attachment to the host, more or less regularly pinnately to bipinnately branched in one plane; terete below, compressed above; main axes 1.5 mm. broad, 200–350 μ thick; surface cells more or less isodiametrical, 20–25 μ diam.; medullary cells 50–60 μ diam., without lenticular thickenings; spermatalial branchlets ovate, solitary on ultimate

branches, commonly with one or two horn-like lateral projecting knobs; tetrasporic stichidia simple, very much like sterile ultimate branchlets, without lateral knobs; cystocarps of variable size and irregular arrangement, ovate, 1 to 3 lateral or terminal on the pinnae (pl. 26, fig. 2; pl. 25, fig. 3; pl. 28, figs. 4, 5).

Type. Epiphytic on *Corallina*, tide pools in the lower littoral, reef near Scripps Pier, La Jolla, California, November 22, 1943, Dawson 43-157 (Herb. Univ. Calif. no. 685719).

The small size, delicate nature and fine-pinnate branching of this species distinguishes it from other *Laurencia* species of the California coast. It is distinguished from *L. splendens* (1, p. 219) by its smaller size and finer and less regular branching. In all proportions it is about one-half the size of *L. splendens*. Reproductive differences cannot be pointed out, since *L. splendens* was described from sterile material.

Laurencia Maxineae has been found, other than at the type locality, two miles farther south, on the reef near the "Beach Club," on La Jolla Bay. It grows not only on *Corallina*, but on *Gelidium* and other red algae, on wave dashed littoral rocks at or below mean low tide line. It is not a common plant, but when exactly the right habitat is found in the extreme lower littoral, where rather thick growths of *Corallina* occur, it may be encountered fairly frequently, growing on old plants of that genus.

Laurencia scrippsensis sp. nov. Thalli 10–16 mm. alti, fusco-rubri, caespitosi; surculis compressis, 1.0–1.5 mm. latis, 400–500 μ crassis, pinnatis, cum ramis in uno plano; cellulis superficialibus 20–30 μ diam., cubicis, vallum non formantibus; cellulis medularibus 70–90 μ diam., sine tumoribus lenticularibus; cystocarpiis conspicue tumentibus; tetrasporangiis in pinnatis immutatis paene; ramulis spermatangialibus ovatis.

Thalli epiphytic, 10–16 mm. high, deep reddish-brown, composed of several spreading, or contorted and caespitously congested shoots arising from the point of attachment to the host, the shoots compressed, 1.0–1.5 mm. broad, 400–500 μ thick, irregularly alternate-pinnately branched in one plane; surface cells more or less isodiametric, 20–30 μ diam., not forming a palisade layer; medullary cells 70–90 μ diam., without lenticular thickenings; cystocarps forming promiscuous bulges on highly irregular branched shoots; tetrasporangial plants more regularly pinnate, less densely branched and with sometimes more strongly, sometimes less strongly compressed shoots; tetrasporangia borne in essentially unmodified pinnae; spermatangial branchlets broadly

EXPLANATION OF THE FIGURES. PLATE 26.

PLATE 26. SOUTHERN CALIFORNIA LAURENCIAE. FIG. 1. *L. diegoensis*: mature spermatangial specimen in first year of development (from type collection), $\times 1$. FIG. 2. *L. Maxineae* attached to *Corallina*: a, spermatangial plant; b, tetrasporic plant. (From type collection), $\times 1\frac{1}{2}$. FIG. 3. *L. scrippsensis*: almost mature cystocarpic plant (from type collection), $\times 1\frac{1}{2}$.

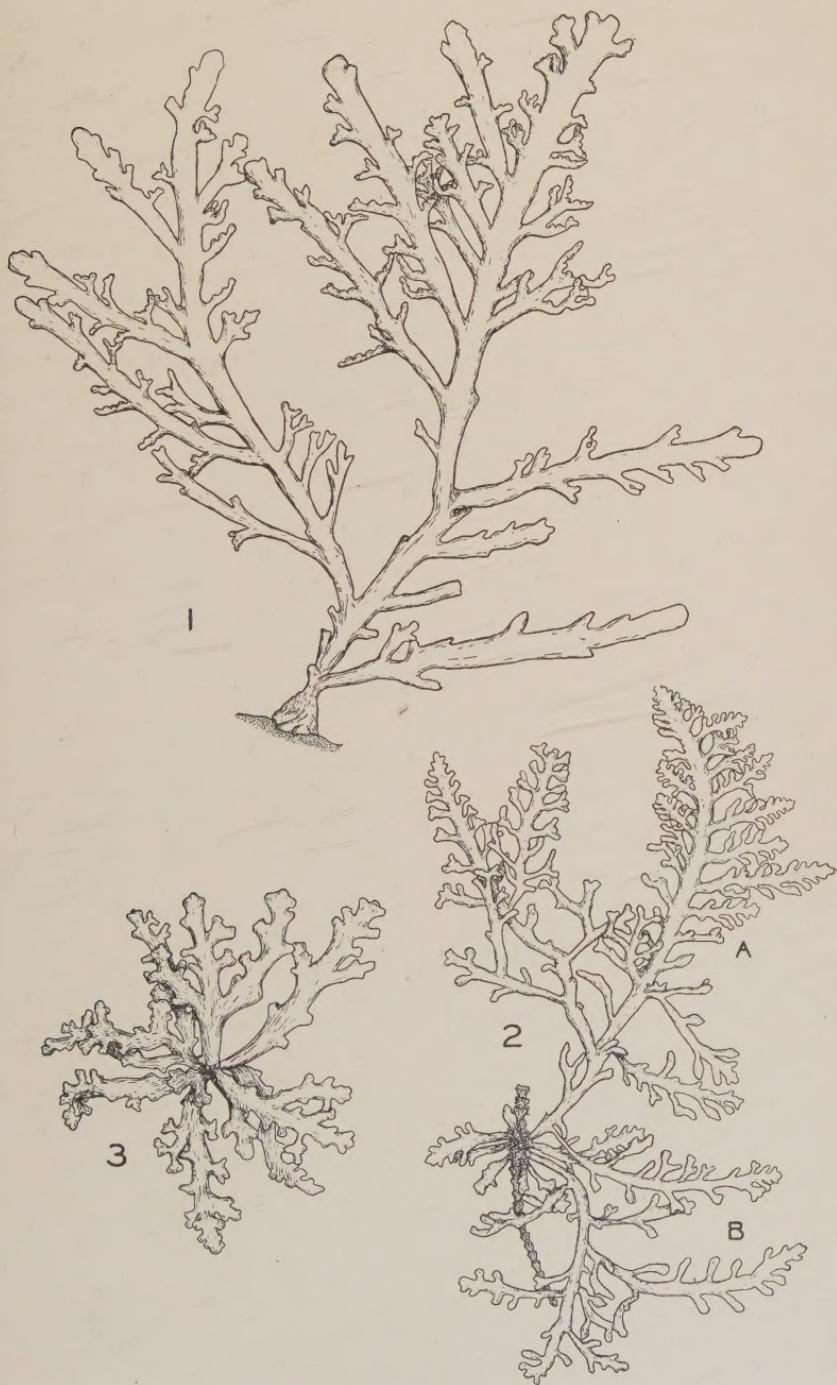


PLATE 26. SOUTHERN CALIFORNIA LAURENCIAE.

ovate to nearly urn-shaped, usually solitary or in pairs in very short pinnae given off from the compressed shoots (pl. 26, fig. 3; pl. 27, figs. 1, 2, 4).

Type. Epiphytic on *Sargassum Agardhianum*, in pools in the lower littoral, on the reef near Scripps Pier, La Jolla, California, November 22, 1943, Dawson 43-158 (Herb. Univ. Calif. no. 685720).

The small size, caespitose growth form and epiphytic habit of this species distinguish it from all other compressed species of *Laurencia* thus far described from the Pacific American coast. It is a very abundant small plant and on some wave-swept rock platforms at La Jolla it grows in dense, fleshy, closely adherent, caespitose clumps, almost covering the underlying host plants. In shaded places or in pools it has a less contorted and a more openly branched habit.

Laurencia diegoensis sp. nov. Thalli 8-20 cm. alti, fusco-rubri; surculis erectis compressis, irregulariter bipinnatis, elongatis cum brevioribus mixtis; ramis in uno plano orientibus; ramis principibus 2-3 mm. latis, 0.5-0.8 mm. crassis; cellulis superficialibus cubicis, 20-30 μ crassis, vallum non formantibus; cellulis medullaribus 80-100 μ crassis, sine tumoribus lenticularibus; ramulis spermatangialibus bulbosis, 1 ad 4 in ramis ultimis brevis; cystocarpis bulbosis, 2 ad 5 in fasciculis terminalibus; tetrasporangiis compositis, subteretis.

Thalli 8-20 cm. tall, deep reddish-brown; composed of a conic holdfast and erect, strongly compressed shoots; branching irregularly alternate-bipinnate, all in one plane; branches of different orders of irregular length, giving the frond an unsymmetrical appearance; main branches 2-3 mm. broad, 0.5-0.8 mm. thick; surface cells more or less isodiametric, 20-30 μ diam., not forming a palisade layer; medullary cells 80-100 μ diam., without lenticular thickenings; spermatangial branchlets bulbous, borne singly or in groups of 2 to 4 along short ultimate branches; cystocarps bulbous, borne in terminal clusters of 2 to 5 on short ultimate branches; tetrasporangial stichidia compound, the parts rather slender and nearly terete (pl. 26, fig. 1; pl. 28, figs. 1, 2, 3).

Type. On rocks between the 1.0 and 0.0 foot tide levels, reef near Scripps Pier, La Jolla, California, November 22, 1943, Dawson 43-156 (Herb. Univ. Calif. no. 685722).

Other collections seen. CALIFORNIA. Orange County: Balboa, Gardner 2498; Laguna Beach, Fosberg T193, Guernsey LXV. Los Angeles County: Santa Monica, Gardner 2580. San Diego County:

EXPLANATION OF THE FIGURES. PLATE 27.

PLATE 27. SOUTHERN CALIFORNIA LAURENCIAE. FIG. 1. *L. scrippensis*: portion of a cystocarpic plant, $\times 5$. FIG. 2. *L. scrippensis*: portion of a tetrasporic plant, $\times 9$. FIG. 3. *L. Maxineae*: portion of a spermatangial plant, $\times 9$. FIG. 4. *L. scrippensis*: portion of a spermatangial plant, $\times 9$.

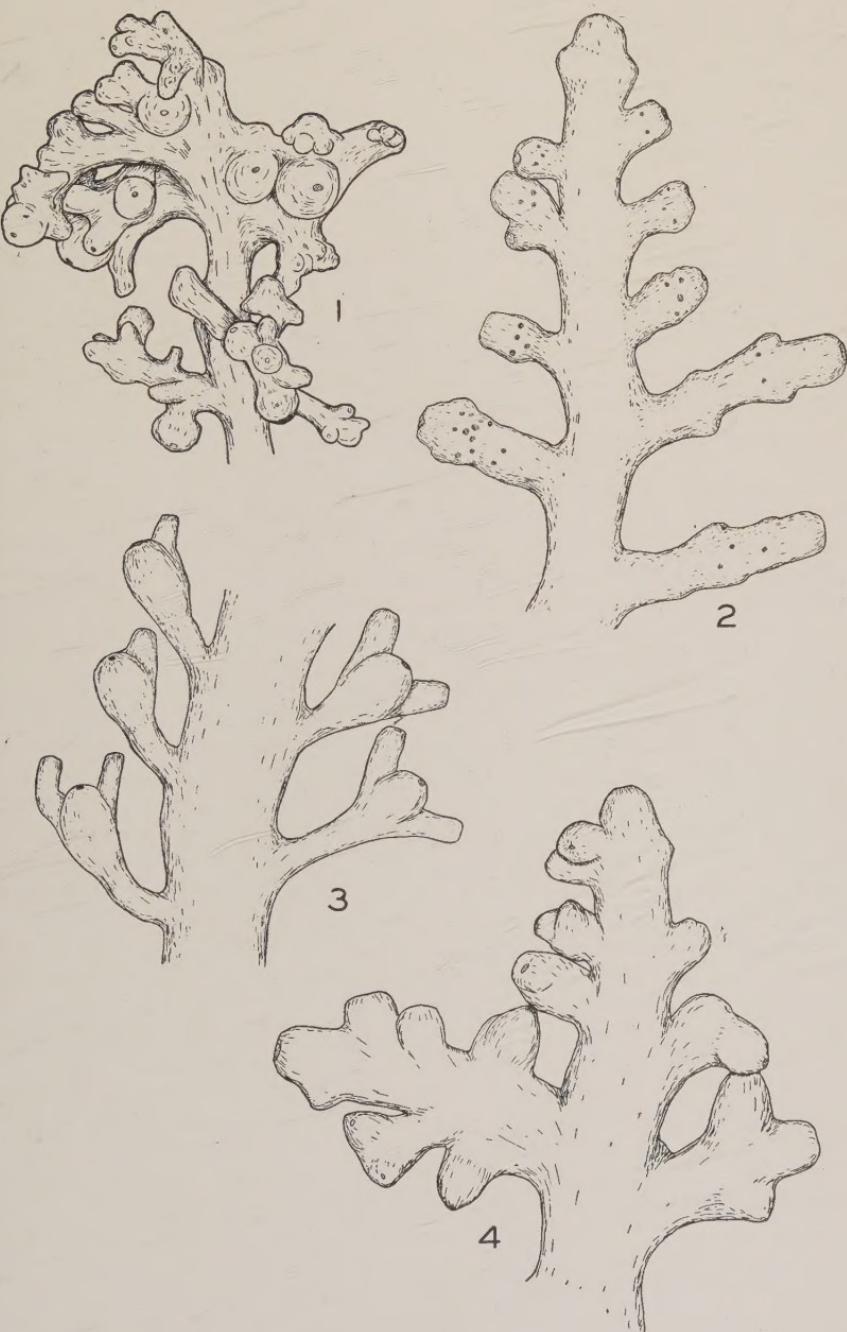


PLATE 27. SOUTHERN CALIFORNIA LAURENCIAE.

vicinity of San Diego, *Wright* (Herb. Univ. Calif. no. 94427); La Jolla, *Snyder* (Herb. Univ. Calif. no 77965), *Dawson* 43-160.

The species is perennial. Figure 1 (pl. 26) is of a small, mature, spermatangial plant in the first year of development.

Many plants in their second year of growth have been found at La Jolla in reproductive state. They are of the same branching proportions as the smaller plants, but are more or less denuded of branches in the lower parts and are encrusted to varying degrees with bryozoans and melobesiae.

In looking over a collection of some thirty specimens labeled *Laurencia spectabilis* in the University of California Herbarium, a number of specimens were found to correspond with those collected by the author in the San Diego region. Furthermore, it was found that the specimens could all be separated into two quite distinct morphological groups. These two groups exhibited geographical separation as well. The first group, here considered to be true *L. spectabilis*, is composed of collections ranging from Whidbey Island, Washington, to Santa Barbara, California. The other group, *L. diegoensis*, contains examples from Santa Monica, Balboa, Laguna Beach, La Jolla, and San Diego, California.

The southern plants are all of narrower proportions. Conspicuously broad or expanded main axes are not present in *Laurencia diegoensis*. Most striking, in comparing series, is the prevalence in *L. spectabilis* of regular branching. The branches of the various orders are typically of uniform length, and this is particularly true of the small, ultimate branchlets which are especially uniform, gradually reduced in size toward the growing apices. This uniformity is conspicuously absent in *L. diegoensis* in which the rate of growth of the branchlets is variable and even in the young stages creates an irregular and unsymmetrical branch pattern.

The geographical distribution seems reasonably well defined, with a region between Santa Barbara and Santa Monica marking the southern limit of *L. spectabilis* and the northern limit of *L. diegoensis*. Intensive study of plants growing in this region will undoubtedly bring out details of intergradation and divergence of the two closely related species.

Laurencia diegoensis differs from *L. splendens* (1, p. 219, fig. 24) in being generally a larger plant and in not being epiphytic. It is superficially similar to *L. pinnata* (3, p. 242, pl. 28) but may be distinguished specifically by the tetrasporic stichidia which in *L.*

EXPLANATION OF THE FIGURES. PLATE 28.

PLATE 28. SOUTHERN CALIFORNIA LAURENCIAE. FIG. 1. *L. diegoensis*: portion of a spermatangial plant, $\times 5$. FIG. 2. *L. diegoensis*: portion of a cystocarpic plant, $\times 5$. FIG. 3. *L. diegoensis*: portion of a tetrasporic plant, $\times 5$. FIG. 4. *L. Maxineae*: portion of a tetrasporic plant, $\times 7$. FIG. 5. *L. Maxineae*: portion of a cystocarpic plant, $\times 7$.

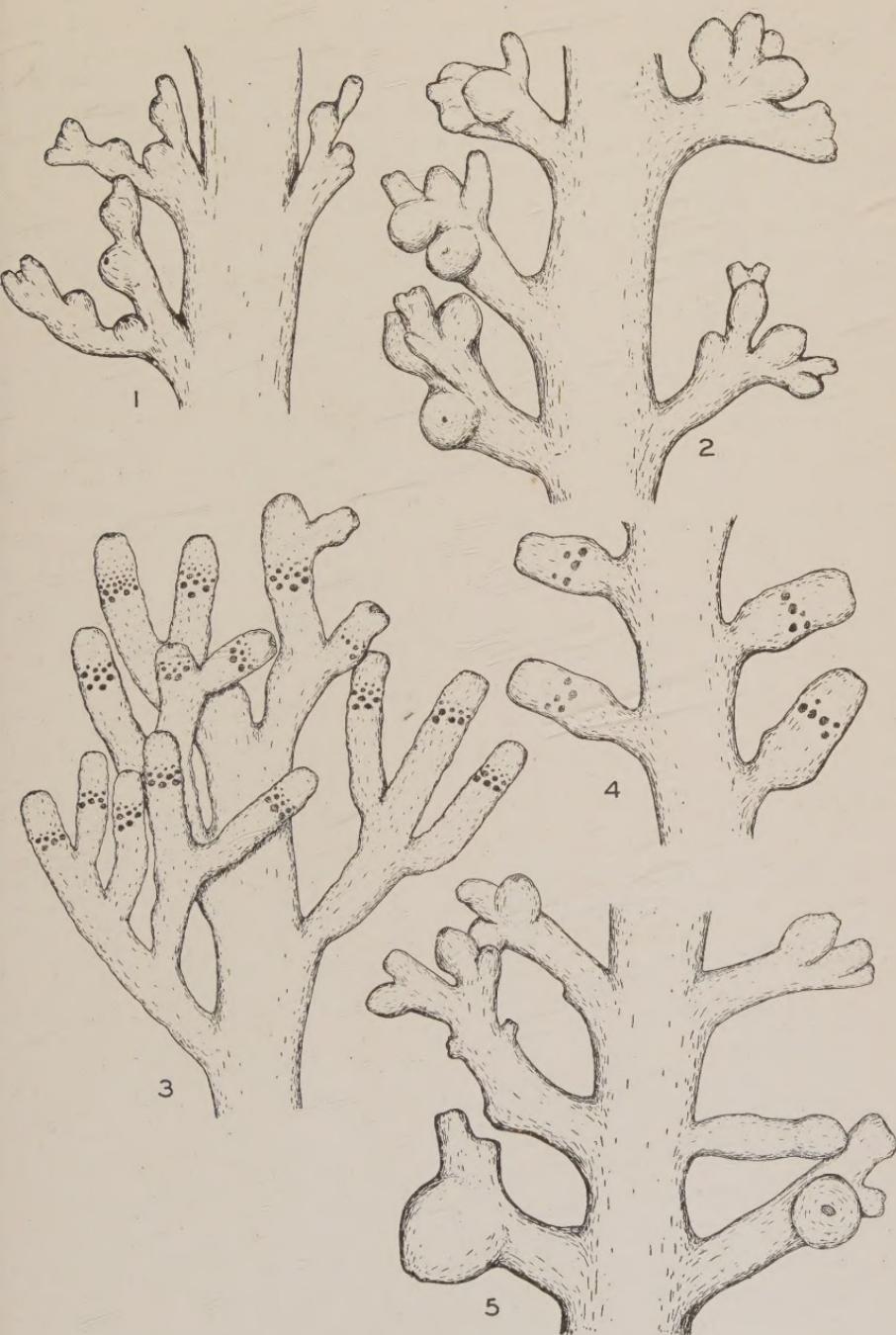


PLATE 28. SOUTHERN CALIFORNIA LAURENCIAE.

pinnata are described as occurring in the "similar ultimate branchlets." In *L. diegoensis* the compound, terete stichidia are quite unlike the vegetative branches. Yamada (3, p. 246) has pointed out the distinctions between *L. spectabilis* and *L. pinnatifida*, particularly the presence of abundant lenticular thickenings in the latter species. He recognized the presence of a broader and a narrower plant under the name *L. spectabilis*, but did not distinguish them specifically.

Scripps Institution of Oceanography,
University of California, La Jolla,
December, 1943.

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NOMINA CONSERVANDA PROPOSALS FOR TEN GENERA OF TREES AND SHRUBS

ELBERT L. LITTLE, JR.

While checking the nomenclature of the forest trees of the United States, I observed that ten generic names of trees and large shrubs now in almost universal use are technically invalid or of questionable validity under the latest International Rules of Botanical Nomenclature (ed. 3, 152 p. 1935. Sixth Internat. Bot. Cong. Amsterdam, Proc. 2 vol. 1935-36). These well-known names are: *Cedrus* Trew, *Abies* Mill., *Coccoloba* P. Br. ex L., *Rhamnus* L., *Condalia* Cav., *Fremontia* Torr. (1853), *Pilocereus* K. Schumann, *Cephalocereus* Pfeiff., *Bucida* L., and *Halesia* Ellis ex L. The nomenclature of each is discussed here, and it is suggested that these names be submitted at the next International Botanical Congress as *nomina generica conservanda proposita*. To reject these names would cause confusion by requiring a few new generic names and more than a hundred specific transfers. All these names have been adopted in my manuscript, "Check List of the Native and Naturalized Trees of the United States," with the exception of the genera *Cedrus* and *Pilocereus*, which were outside the scope of that paper. As it seems likely that most of these names will be conserved later, there will be more stability in nomenclature by using these well-established names.

"Index Londonensis" (6 vols. 1929-31; Suppl. 1941), an index to illustrations of plants, shows that usage is strongly in favor

of all the names proposed for conservation. In fact, some of the rejected names were not even represented in that compilation.

Six of the names listed above are later homonyms (Articles 60 [3] and 61) and four are later synonyms (Article 60). These homonyms became invalid in 1930 when the rule about homonyms was changed to reject a later homonym even if the earlier homonym is a synonym and not in use. The American Code of Nomenclature (Bull. Torrey Bot. Club 34: 167-178. 1907), also in use in the United States for some years earlier, had contained a similar provision. Previous to 1930, the earliest available name was adopted, even if it were a later homonym, provided that the earlier homonym had been rejected as a synonym. Of the names here under discussion the three later homonyms named for persons were given to genera a second time because the earlier names were found to be synonyms.

As Rehder, Weatherby, Mansfeld, and Green (Kew Roy. Bot. Gard. Bull. Misc. Inform. 1935: 341-544. 1935) stated, the homonym rule was changed with the definite understanding that all well-known generic homonyms should, as far as possible, be adopted as *nomina conservanda* under Article 21. These botanists made a systematic search for later homonyms among the seed plants and submitted their list to the Sixth International Botanical Congress at Amsterdam in 1935. The names were divided alphabetically among different persons, but names beginning with the letters D to K were not checked in time to be published. As a result of this and other proposals, additional *nomina conservanda* of seed plants were accepted (Kew Roy. Bot. Gard. Bull. Misc. Inform. 1940: 81-134. 1940). Additional names may be submitted to the Executive Committee at any time, and, if provisionally approved by it, may be retained under authority of the committee pending decision of the next International Botanical Congress (Articles 21 and 22).

Seven of the earlier homonyms and synonyms discussed here were published shortly after 1753 in rare works which did not use binomials. One was published by Miller (Gard. Dict. abridged, ed. 4, 3 vols., illus. 1754). Druce (Bot. Exch. Club Soc. Brit. Isles Suppl. 1913: 426-436. 1914) restored the generic names of that work. Two were published by Duhamel (Traite Arbr. Arbust., 2 vols., illus. 1755). Nieuwland (Am. Midland Nat. 1: 16. 1909) called attention to the genera of that reference. Another name mentioned here was published by Trew (Herb. Blackw., Cent. 2, illus. 1754), a work revived also by Nieuwland (Am. Midland Nat. 1: 221-224. 1910). Three were in the well-known work by Patrick Browne (Civ. Nat. Hist. Jamaica, 503 pp., illus. 1756).

Genera in these books are accepted by most modern authors, though Article 67 (3) and Example (2) raise some questions

about names of this kind. It would have been simpler in the beginning to have rejected all works not adopting binomial nomenclature, as in an American Code rule. Genera appearing in these works were without species and thus had no species from which a type could be selected. Some of the names were genera of pre-Linnaean authors that were accepted by later workers anyway. However, a few of these rare books contain different generic names that technically invalidate the later homonyms and synonyms now in use, though most of these names have been detected. Proposals to reject generic names published in works after 1753 not adopting binomial nomenclature were defeated by large majorities at the Congresses in 1905 and 1930. It is not likely that a similar amendment would be accepted now. Wilmott (*Kew Roy. Gard. Bull. Misc. Inform.* 1935: 66, 90–92. 1935; *Sprague, Synop. Prop. Nomencl.* Sixth Internat. Bot. Cong. 15, 77–78. 1935; *Sprague, Prel. Opin. Nomencl. Prop.* Sixth Internat. Bot. Cong. 508. 1935), proposed that a list of works of this kind contrary to the rules be regarded as not validly published. His list included the books of Miller and Browne mentioned below but not some other rare works cited here. If the rule applied only to a definite list of books, there would still be a few other, rarer books, such as those cited in this paper, containing unrecorded names. A partial list of these works might cause more confusion than no list at all. Wilmott's proposal was referred to a special committee to report on the effects of its adoption (Sixth Internat. Cong. Bot. Amsterdam, Proc. 1: 338–341. 1936). However, as most of these early generic names have been accepted or rejected in favor of *nomina conservanda*, there would be less confusion now to retain all. Wilmott's proposal would require many changes in the *nomina conservanda* and create more complications in nomenclature. Very few additional early published names probably remain undetected, as the number of rare books has a limit. When earlier names are discovered, the later names affected can be conserved.

When the names of Cactaceae were being checked, it was discovered that present usage of *Cephalocereus* Pfeiff. and *Pilocereus* Pfeiff. is contrary to Articles 51 and 16. Both names as well as the earlier name *Cephalophorus* Lem., are all based upon the same type species, *Cactus senilis* Haworth, and therefore, are synonyms. A search of the literature revealed that Britton and Rose (*Contr. U. S. Nat. Herb.* 12: 415. 1909; *Cactaceae* 2: 25. 1920) had observed this fact and that Werdermann (*Beiträge zur Nomenklatur. II. Cephalocereus* Pfeiff. und *Pilocereus* K. Sch. [nicht Lem!]; *Kakteenkunde* 1937: 129–130, illus. 1937) had proposed that *Cephalocereus* and *Pilocereus* be made *nomina conservanda*. It seems desirable to summarize here the nomenclature of these genera and to confirm Werdermann's proposal.

There is some question whether it is necessary to conserve *Abies* Mil. and *Cephalocereus* Pfeiff. in order to retain them as valid names. Whether to conserve *Fremontia* Torr. (1853) or accept *Fremontodendron* Cov. instead is a controversial matter, because both names are in use. The other seven names clearly are illegitimate and must either be abandoned or conserved.

The policy of conserving names of small genera is subject to deliberation. These invalid names have not more than five recognized species: *Cedrus* Trew, *Fremontia* Torr. (1853), *Bucida* L., and *Halesia* Ellis. It sometimes is simpler to change a name than to make an exception in the rules, though names of a few monotypic genera have been conserved. However, if there is greater stability in nomenclature by retaining the name of a small but well known genus, the name should be conserved.

Another name in use, *Hopea* Roxb. (Pl. Coast Corom. 3: 7, pl. 210. 1819), family Dipterocarpaceae, is invalidated by an earlier homonym originally applied to a tree species of the United States. *Hopea* Garden ex L. (Mant. Pl. 1: 14. 1767) was published with one species, *Hopea tinctoria* Garden ex L. This genus was combined in 1791 with *Symplocos* Jacq. (Enum. Pl. Ins. Carib. 5. 1760), and the United States species is *Symplocos tinctoria* (Garden) L'Hérit. *Hopea* Roxb. is in use for a genus of about fifty species in the East Indies, Philippine Islands, and India. This name, which is outside the scope of my study, probably will be considered at the next Congress with the other homonyms from the letters D to K.

The ten generic names herein proposed as *nomina conservanda* are discussed according to the sequence and numbers of Dalla Torre and Harms (Gen. Siphon. 921 pp. Lipsiae. 1900-07).

23. (Pinaceae.) *Cedrus* Trew, Cedr. Lib. Hist. 6., illus. 1757. Not *Cedrus* Duhamel, Traité Arbr. Arbust. 1: 139, pl. 52 and fig. 1755. Not *Cedrus* Mill., Gard. Dict. ed. 7. 1759. Type species: *Cedrus libani* Barre, ex Loud., Hort. Brit. 388. 1830.

Nomina rejicienda: none?

Cedrus Trew is a well-known genus of four species of Northern Africa, Cyprus, Asia Minor, and Asia. The name is accepted unanimously and, of course, was adopted by Bentham and Hooker, Index Kewensis, Engler and Prantl, and Dalla Torre and Harms.

Just as there has been confusion in the application of the common name "cedar" to more than one genus, the ancient Greek name *κέδρος* was used for different genera by early botanists. The earliest use of *Cedrus* after 1753 was by Duhamel (1755), who followed Tournefort (Elem. Bot. 1: 461, pl. 361. 1694) and even copied the latter's drawings in applying the name to species now in *Juniperus* L. (1753). Duhamel (p. xxviii) divided *Juniperus* L. into three genera, *Juniperus*, *Cedrus*, and *Sabina*, but did not use binomials. *Sabina* had been published the preceding

year by Miller (Gard. Dict. abridged, ed. 4, vol. 3. 1754). Trew apparently was the first after Linnaeus to use *Cedrus* in its present sense for the cedar of Lebanon, though he did not make a proper binomial. *Cedrus* Mill. is a synonym of *Cedrela* P. Br. (Civ. Nat. Hist. Jamaica 158, pl. 10, fig. 1. 1756), family Meliaceae. Miller's name was based on a different use of the name *Cedrus* by Plukenet (Almag. Bot. Phyt. 92, pl. 157, fig. 1. 1696) and was adopted in the second edition of his Gardeners Dictionary (1733).

Cedrus Trew is so well established for the cedar of Lebanon and related species that apparently no direct synonyms have been made. It seems better to make this name a *nomen conservandum* than to erect a new generic name, even for only four species.

29. (Pinaceae.) *Abies* Mill., Gard. Dict. abridged, ed. 4, vol. 1. 1754. Not *Abies* Trew, Herb. Blackw., Cent. 2, pl. 198. 1754. Type species: *Abies alba* Mill., Gard. Dict. ed. 8, *Abies* no. 1. 1768.

Nomina rejicienda: none?

Abies Mill. contains about forty species of trees, known as firs, in north temperate regions. The name is in universal usage and was accepted by Bentham and Hooker, Index Kewensis, Engler and Prantl, and Dalla Torre and Harms. *Abies* Trew was published with colored plate for a species of spruce, now included under *Picea Abies* (L.) Karst.

Tournefort (Inst. Rei Herb. 1: 585, pl. 353-354. 1700) used *Abies* in the modern sense, but the two ancient Latin names *Abies* and *Picea* have been interchanged at times in the past. For example, Loudon (Arb. Frut. Brit. 4: 2293, 2329. 1838) used *Picea* for the firs and *Abies* for the spruces. However, for many years the present and opposite interpretation has been universal. Apparently there are no direct synonyms. Both *Abies* Mill. and *Abies* Trew were published in works that did not adopt binomial nomenclature. It is uncertain which name appeared first in 1754. If Miller's name was earlier, then it has priority and does not need to be conserved (Article 16). However, because of the uncertainty, it seems best to conserve *Abies* Mill.

Nieuwland (Am. Midland Nat. 1: 221-224. 1910) not only cited *Abies* Trew (1754) but another publication of *Abies* in 1754 in a rare work said to have been by Dom. Robbe and not available to me. He cited this list of plants as follows: "(Dom. Robbe.) Catalogue des plantes usuelles avec une explication des principaux termes de botanique, pour servir d'introduction aux démonstrations commencées dans le jardin de botanique le 27 Juin 1754, sous les auspices de Mgr. le Duc de Chaulnes, etc. A Amiens. 1754." I do not know whether *Abies* in this publication is the same as *Abies* Mill. or *Abies* Trew.

2209. (Polygonaceae.) *Coccoloba* P. Br. ex L., Syst. Nat. ed. 10, 2: 1007, 1367. 1759. Type species: *Coccoloba uvifera* (L.) L., Syst. Nat. ed. 10, 2: 1007. 1759.

Nomina rejicienda: Guaiabara Mill., Gard. Dict. abridged, ed. 4, vol. 2. 1754. *Coccolobis* P. Br., Civ. Nat. Hist. Jamaica 209, pl. 14, fig. 3. 1756. *Naucorephes* Raf., Fl. Tellur. 2: 34. 1845. *Schlosseria* Mill. ex Steudel, Nom. Bot. ed. 2, 2: 531. 1841. *Lyperodendron* Willd. ex Meissn. in DC., Prodr. 14: 168. 1857; as synonym. *Uvifera* (L.) Ktze., Rev. Gen. 2: 561. 1891.

Coccoloba P. Br. ex L. is a large genus of about 130 species of shrubs and trees in the American tropics. This name is in almost universal usage and was accepted by Bentham and Hooker, Index Kewensis, Engler and Prantl, and Dalla Torre and Harms. The later synonyms are not in use.

Guaiabara Mill., a pre-Linnaean genus of Plumier, was proposed in a work without binomial nomenclature. Druce (Bot. Exch. Club Soc. Brit. Isles Suppl. 1913: 405-440. 1914), in calling attention to the genera published in this edition, listed *Guaiabara* (Plum.) Mill. as a synonym of *Coccoloba* L. but made no reference to the later publication of the latter name, which was published in 1759, not 1753. *Guaiabara* was taken up by Boehm. (in Ludw., Def. Gen. Pl. 402. 1760). A variant spelling was *Guabara* Adans. (Fam. Pl. 2: 277. 1763). Miller's name was adopted in 1922 by House (Am. Midland Nat. 8: 64. 1922), who made three transfers to this genus under the spelling *Guajabara*.

Kuntze (Hort. Cliffs 487. 1788), regarding 1735 as the starting date, adopted the earlier Linnean name, *Uvifera* L.

Several recent authors, such as Small (Fl. Southeast. U. S. 383. 1903; Man. Southeast. Fl. 461. 1933) have taken up the older name and spelling, *Coccolobis* P. Br. Sandwith (Jour. Bot. 78: 99. 1940) held that the two spellings were different names (Article 70). He wrote: "In conclusion, it may be pointed out, with regret, that *Coccolobis* P. Br., according to two good nomenclatural authorities, not merely antedates *Coccoloba* L. but must actually be treated as a different name. The two names are not orthographic variants, since *Coccolobis* has the termination of a diminutive, and *Coccoloba* is thus an illegitimate substitution. We are, therefore, faced with a very large number of necessary transfers from *Coccoloba* to *Coccolobis*, unless it is decided to conserve *Coccoloba*. The discovery of the earliest publication of some of these will not be an easy task, since the 'Index Kewensis' formerly treated the two names as orthographic variants, and so have the American writers (e.g., Britton, Small), who have correctly adopted *Coccolobis*, attributing the binomial to the original author of the species under *Coccoloba*. Even apart from such unintentional new combinations, considerably more than a hundred others will have to be made." He even made (p. 100) the new combination *Coccolobis gymnorhachis* (Sandwith) Sandwith, based upon *Coccoloba gymnorhachis* Sandwith.

Linnaeus (Syst. Nat. 2: 1367. 1759) did not intend to make a

new name when he cited Browne as author of the generic name; he omitted Browne's different spelling.

As *Coccoloba* P. Br. ex L. is used by most authors instead of *Coccolobis* P. Br. and as there is some question as to whether the two are different names or orthographic variants, it seems best to conserve the later and best known spelling, *Coccoloba* P. Br. ex L. Then any new combinations some authors might make would be avoided. With either spelling, P. Browne should be cited as author.

4648a. (Celastraceae.) *Rhacoma* L., Syst. Nat. ed. 10, 2: 896, 1114. 1759. Not *Rhacoma* Adans., Fam. Pl. 2: 117. 1763. Type species: *Rhacoma crossopetalum* L., Syst. Nat. ed. 10, 2: 896. 1759.

Nomina rejicienda: *Crossopetalum* P. Br., Civ. Nat. Hist. Jamaica 145, pl. 16, fig. 1. 1756.

Rhacoma L. contains ten to fifteen species of shrubs and small trees in tropical America. This name was accepted by Engler and Prantl and by Dalla Torre and Harms (Supplementum) and is well established in use. Some authors include in it the related smaller genera *Myginda* Jacq. (Enum. Pl. Carib. 1. 1760) and *Gyminda* (Griseb.) Sarg. (Gard. and Forest 4: 4. 1891). In Index Kewensis *Rhacoma* L. was placed as a synonym of *Myginda* Jacq., published a year afterwards.

The later homonym *Rhacoma* Adans. is a synonym of a section of *Centaurea* L. (Sp. Pl. 909. 1753; Gen. Pl. ed. 5, 389. 1754), family Compositae, and has not been used by recent authors.

Crossopetalum P. Br. was originally described with a single species in a work without binomial nomenclature. *Rhacoma crossopetalum*, published as a single species of a new genus, was based upon *Crossopetalum* P. Br., which was cited as a synonym and from which the specific name was taken. Thus, *Rhacoma* L. was a deliberate change of name and illegitimate under Articles 16 and 60 (1). The genus *Crossopetalum* P. Br. was restored by O. Kuntze (Rev. Gen. Pl. 1: 117. 1891) to include both *Rhacoma* L. and *Myginda* Jacq. Very few others accepted Browne's name. Among these were Hitchcock (Mo. Bot. Gard. Ann. Repts. 4: 70. 1893) and Small (Fl. Southeast. U. S. 735-736. 1903). The names *Crossopetalon* Adans. (Fam. Pl. 2: 224. 1763) and *Crossopetalum* Roth (Enum. Pl. Phaner. Germ. 1 [1]: 515. 1827) were given afterwards to a genus, now section *Crossopetalum* DC. of *Gentiana* L. As *Crossopetalum* P. Br. has not been adopted by later authors, the name established in use, *Rhacoma* L. should be retained as a *nomen conservandum*.

4862. (Rhamnaceae.) *Condalia* Cav., Anal. Cienc. Nat. (Madrid) 1: 39, pl. 4. 1799. Not *Condalia* Ruiz and Pavon, Fl. Peruv. Chil. Prodr. 11, pl. 2. 1794. Type species: *Condalia microphylla* Cav., Anal. Cienc. Nat. (Madrid) 1: 40, pl. 4. 1799.

Nomina rejicienda: none?

The genus *Condalia* Cav. contains about ten species of shrubs and small trees distributed from Southwestern United States and Mexico to South America. The name is in unanimous usage and apparently has no synonyms but is a later homonym of *Condalia* Ruiz and Pavon. *Condalia* Cav. was accepted by Bentham and Hooker, Index Kewensis, by Engler and Prantl, and by Dalla Torre and Harms.

Condalia Ruiz and Pav. is a synonym of *Coccocipsilum* P. Br. (Civ. Nat. Hist. Jamaica 144, pl. 6, fig. 2. 1756) family Rubiaceae, and was already suppressed when the name was given to a second genus. Cavanilles explained the synonymy and dedicated a new genus to the memory of Antonio Condál. If *Condalia* Cav. is not conserved, then a new generic name with specific transfers would be necessary.

5046. (Sterculiaceae.) *Fremontia* Torr., Smithson. Inst. Contr. Knowl. 5 (1) [6 (2)] (Pl. Frémont.) : 5, pl. 2. 1853. Also in Am. Assoc. Adv. Sci. Proc. 4: 191. 1851; *nomen subnudum*. Not *Fremontia* Torr. in Frém. Rept. Explor. betw. Mo. River and Rocky Mts. 91. 1843. Type species: *Fremontia californica* Torr., Smithson. Inst. Contr. Knowl. 5 (1) [6 (2)] (Pl. Frémont.) : 5, pl. 2. 1853.

Nomen rejiciendum: Fremontodendron Cov., Contr. U. S. Nat. Herb. (Botany Death Valley Exped.) 4: 74. 1893.

Fremontia Torr. (1853) is a small genus of shrubs or small trees restricted to California, Arizona, and Lower California. The number of species of these variable plants is interpreted by different authors as one, two, or five, and there is a fossil species, *Fremontia lobata* Axelrod (Carnegie Inst. Wash. Publ. 516: 123, pl. 11, figs. 8, 10. 1939; Miocene, California).

Fremontia Torr. (1843), family Chenopodiaceae, had only one species. The name was suppressed five years later by Torrey himself (in Emory, Notes Mil. Recon. Ft. Leavenworth, Calif. 149. 1848) when he learned that it was the same as *Sarcobatus* Nees, published for the same species shortly before Torrey's name in a rare and costly work not known in the United States until several years later. As he was required to take up Nees's earlier name, Torrey (Am. Assoc. Adv. Sci. Proc. 4: 191. 1851) used the name *Fremontia* for another genus.

The name *Fremontia* Torr. (1853) was accepted for the genus of Sterculiaceae by Bentham and Hooker, Index Kewensis, Engler and Prantl, and Dalla Torre and Harms. It has been adopted also in nearly all the floras and manuals covering its area, including: Jepson, Man. Fl. Pl. Calif. 636. 1925; Sargent, Man. Trees No. Am. ed. 2, 749. 1922; Sudworth, U. S. Dept. Agr. Misc. Circ. 92 (Check List Forest Trees U. S.): 206. 1927; Munz, Man.

Southern Calif. Bot. 311. 1935; McMinn and Maino, Illus. Man. Pac. Coast Trees 291. 1935; Jepson, Fl. Calif. 2: 506. 1936; Van Dersal, U. S. Dept. Agr. Misc. Publ. 303 (Native Woody Plants of U. S.): 133. 1938; McMinn, Illus. Man. Calif. Shrubs 352-356, illus. 1939; Tidestrom and Kittell, Fl. Ariz. and New Mex. 124. 1941, and Harvey, Madroño 7 (A Revision of the Genus *Fremontia*): 100-110. 1943.

Fremontodendron Cov. was used in the following publications: Sudworth, U. S. Dept. Agr. Div. Forestry Bull. 14 (Nomenclature of the Arborescent Flora of U. S.): 272. 1897; Sudworth, U. S. Dept. Agr. Div. Forestry Bull. 17 (Check List Forest Trees U. S.): 86. 1898; Sargent, Silva No. Am. 14: 97. 1902 (in list of corrections, though *Fremontia* had been used in the text, vol. 1: 47, pl. 23. 1892); Sargent, Man. Trees No. Am. 676. 1905; Eastwood, Calif. Acad. Sci. Occas. Papers 9 (Handbook of Trees of Calif.): 69, pl. 48. 1905; Britton and Shafer, No. Am. Trees, 695. 1907; Sudworth, Forest Trees Pac. Slope 382. 1908; Dayton, U. S. Dept. Agr. Misc. Publ. 101 (Important Western Browse Plants): 115. 1931; and Kearney and Peebles, U. S. Dept. Agr. Misc. Publ. 423 (Flowering Plants and Ferns of Ariz.): 380. 1942.

Index Londonensis cites for the type species twenty-four illustrations under *Fremontia* and only four under *Fremontodendron*.

Only one species was known in this genus until 1918, when *Fremontodendron mexicanum* Davidson was published under the second generic name. Three additional species were described under *Fremontia* by Eastwood in 1934.

Harvey (Madroño 7: 100-110, illus. 1943) has accepted the name *Fremontia* for this genus in her recent taxonomic revision. She noted that this name was a later homonym and technically still under consideration by the special committee appointed by the Amsterdam Congress. Later homonyms were taken up alphabetically but a few letters, including F, were not finished in time for the Congress. As *Fremontia* is the name now used by a majority of taxonomists of Western United States, she preferred to await the results of the committee before making further nomenclatural changes.

The case for conserving *Fremontia* Torr. (1853) is not as strong as that for most of the names presented here, as the name is not in universal use and as the genus is a small one. However, it should be borne in mind that Torrey's procedure of honoring Frémont with a second genus when the first one was found invalid was in keeping with the customs of the times and correct under the rules until 1930. As it was the intention under the rules to conserve the later homonyms invalidated in 1930 and as this name was not considered at the 1935 Congress, *Fremontia* doubtless will be presented at the next one.

5402. (Cactaceae.) *Pilocereus* K. Schumann¹ in Engler and Prantl, Natürl. Pflanzenfam. 3 (6a): 179. 1894. Not *Pilocereus* Lem., Cact. Gen. Nov. Sp. Hort. Monvill. 6. 1839. Type species: *Pilocereus leucocephalus* Poselger, Allg. Gartenz. 21: 126. 1853.

Nomina rejicienda: none?

Pilocereus K. Schumann contains about forty species from Florida and Southwestern United States south to South America. This name was accepted with authorship attributed to Lemaire by K. Schumann in Engler and Prantl and by Dalla Torre and Harms.

Pilocereus Lem. was originally published as a new genus and segregate from *Cereus* Mill. with two species transferred from *Cereus*. *Pilocereus senilis* was described at length and *P. columnna* mentioned. As so defined, *Pilocereus* Lem. is a direct synonym of *Cephalophorus* Lem. (Cact. Aliq. Nov. Hort. Monvill. p. xii. 1838; before May 5) and *Cephalocereus* Pfeiff., Allg. Gartenz. 6: 142. 1838 (May 5). All three names are based upon the same type species, *Cereus senilis* Haworth, and are synonyms (Article 51). As the third in this series of names, *Pilocereus* Lem. must be rejected (Article 16).

Some authors, such as Britton and Rose (Cactaceae 2: 25. 1920), regarded *Pilocereus* Lem. as a synonym of *Cephalocereus* Pfeiff. in accordance with the rules. Berger (Mo. Bot. Gard. Ann. Repts. 16: 69. 1905) applied the name as a subgenus, *Cereus* subg. *Pilocereus* Berger, and stated: "The name *Pilocereus* was originally employed for *Cephalocereus*. These were separated by Schumann, whilst *Pilocereus* was made the recipient of any strange-looking *Cereus*, especially those with hairy areoles. By degrees *Pilocereus* has become a very heterogeneous and senseless genus."

Thus, *Pilocereus* is now established in a different sense from that of Lemaire. It seems simplest to conserve the genus as emended by K. Schumann, as suggested by Werdermann (Kakteenkunde 1937: 130. 1937) or as emended by a later author, rather than to erect a new genus and make many transfers to it. If *Pilocereus* as a conserved genus is reunited with *Cephalocereus*, then the latter name still is used (Article 21, Note 3, and Article 56).

5403. (Cactaceae.) *Cephalocereus* Pfeiff., Allg. Gartenz. 6: 142. 1838 (May 5). Type species: *Cephalocereus senilis* (Haw.) Pfeiff.

Nomina rejicienda: *Cephalophorus* Lem., Cact. Aliq. Nov. Hort. Monvill. p. xii. 1838 (before May 5). Not *Cephalophora* Cav.,

¹ Werdermann's proposal to conserve *Pilocereus* and *Cephalocereus* has recently been discussed by Leon Croizat (Notes on *Pilocereus*, *Monvillea* and *Malacarpus* with special reference to Colombian and Venezuelan species. Caldasia 8: 251–260. 1943). He stated that the proper reference to *Pilocereus* Lem. nom. conserv. was not to Schumann in Engler and Prantl but to Lemaire's subdivision "C" in Rev. Hort. 1862: 426–430. 1862.

Icon. Descr. Pl. Hisp. 6: 79, pl. 599. 1801. *Pilocereus* Lem., Cact. Gen. Nov. Sp. Hort. Monvill. 6. 1839.

Cephalocereus Pfeiff., as interpreted at present, contains about eight species of Mexico, Bolivia, and Brazil. This generic name was accepted by Engler and Prantl and by Dalla Torre and Harms. Some authors, such as Britton and Rose (Cactaceae 2: 25. 1920), include in *Cephalocereus* the larger, segregate, and emended genus *Pilocereus* discussed above.

Under the International Rules (Article 70) *Cephalophorus* Lem. probably is considered a distinct name from *Cephalophora* Cav. and not an orthographic variant, or homonym, of the latter. Pfeiffer promptly erected the new name *Cephalocereus* because he regarded *Cephalophorus* Lem. as invalidated by the earlier *Cephalophora* Cav. As Pfeiffer's name has become established and *Cephalophorus* Lem. is not used at present, the question can be settled definitely merely by making *Cephalocereus* Pfeiff. a *nomen conservandum*, as Werdermann (Kakteenkunde 1937: 130. 1937) suggested.

5543. (Combretaceae.) *Bucida* L., Syst. Nat. ed. 10, 2: 1025, 1368. 1759. Type species: *Bucida Buceras* L., Syst. Nat. ed. 10, 2: 1025. 1759.

Nomen rejiciendum: Buceras P. Br., Civ. Nat. Hist. Jamaica 221, pl. 23, fig. 1. 1756.

This genus of about five species of the West Indies, Mexico, and Central America, is universally known as *Bucida* L. The name was accepted by Bentham and Hooker, Engler and Prantl, and Dalla Torre and Harms, but in Index Kewensis as a synonym of the later name *Terminalia* L. (Mant. Pl. 1: 27. 1767). The specific name of the type species was the same as Patrick Browne's generic name, which Linnaeus cited as a synonym. Thus, *Bucida* L. definitely is illegitimate under the present rules, Articles 16 and 60 (1), as an intentional change of name.

Buceras P. Br. was originally described with a single species in a work without binomials. The name "Bucida Buceras" appeared without description as a label of the figure and would not be a valid binomial (Article 68 [4]). *Buceras* P. Br. was restored by Hitchcock (Mo. Bot. Gard. Ann. Repts. 4: 85. 1893), but the name was not accepted widely. The later homonym *Buceras* Hall. ex All. (Fl. Pedem. 1: 313. 1785) is a synonym of *Trigonella* L. (Sp. Pl. 776. 1753; Gen. Pl. ed. 5, 338. 1754), family Leguminosae.

6410. (Styracaceae.) *Halesia* Ellis ex L., Syst. Nat. ed. 10, 2: 1044, 1369. 1759. Not *Halesia* P. Br., Civ. Nat. Hist. Jamaica 205, pl. 20, fig. 1. 1756. Not *Halesia* Loefl., Iter Hisp. 188. 1758; as synonym? Type species: *H. carolina* Ellis ex L., Syst. Nat. ed. 10, 2: 1044. 1759.

Nomina rejicienda: Hillia Boem. in Ludwig, Def. Gen. Pl. 71. 1760. Not *Hillia* Jacq., Enum. Pl. Carib. 3. 1760. ? *Halia* St. Lag., Ann. Soc. Bot. de Lyon 8: 175. 1881; *nomen nudum*. *Mohria* Britton, Gard. and Forest 6: 434. 1893 (Oct. 18). Not *Mohria* Sw., Synops. Fil. 159. 1806. *Carlomohria* Greene, Erythea 1: 236. 1893 (Nov. 3). Also Erythea 1: 246. 1893 (Dec. 1). *Mohrodendron* Britton, Gard. and Forest 6: 463. 1893 (Nov. 8).

Halesia Ellis, a genus of about three or four species in Eastern United States and one in Eastern China, is a later homonym of *Halesia* P. Br. In his first letter to Linnaeus in 1756 or 1757, John Ellis (in Smith, James Edward. Select. Corr. Linn. 1: 82. 1821) submitted the plant with the request that it be named *Halesia*, for Stephen Hales, because *Halesia* P. Br. was a synonym. This wish Linnaeus granted, as indicated in his letter to Ellis on May 30, 1759 (in Smith, James Edward. Select. Corr. Linn. 1: 124. 1821). *Halesia* Ellis was accepted by Bentham and Hooker, Index Kewensis, Engler and Prantl, Dalla Torre and Harms, Perkins (*Pflanzenreich* 30 [IV. 241]: 94. 1907), and modern authors.

Halesia P. Br., a later synonym of *Guettarda* L., (Sp. Pl. 991. 1753; L., Gen. Pl. ed. 5, 428. 1754), family Rubiaceae, was published in a work which did not use binomial nomenclature. Apparently no binomials were made in *Halesia* P. Br. or *Halesia* Loefl., and these names were not adopted by later authors. Obviously there can be no confusion in rejecting two earlier homonyms nearly two hundred years old and in which no specific names were made.

Hillia Ludw. was proposed as a new name for *Halesia* Ellis because of the earlier *Halesia* P. Br. However, *Hillia* Jacq., an accepted genus of Rubiaceae with a few species, appearing in the same year, 1760, may have priority.

Except for a period of about twenty years after 1893, when *Mohrodendron* Britton was also in use, *Halesia* Ellis ex L. has been in universal usage. Certain American taxonomists following the American Code rejected it, because of the earlier homonym but later restored it because *Halesia* P. Br. was published without a type species and invalid under their rules. *Halesia* Ellis ex L. was correct under International Rules also until 1930, when Article 61, making later homonyms illegitimate, was adopted. Apparently the oldest available name for this genus is *Carlomohria* Greene, which was not in usage by other authors after its publication. This name has priority of five days over *Mohrodendron* Britton. *Halesia* Ellis ex L., like *Fremonia* Torr. (1753), was in the group of homonyms from D to K not considered at the 1935 Congress and subject to later action.

United States Forest Service,
Department of Agriculture, Washington, D. C.,
December, 1943.

FORESTIERA IN SOUTHERN AND SOUTHWESTERN
TEXAS

V. L. CORY

Material of *Forestiera* growing along the delta of the Rio Grande in Texas has long been accepted by botanists as *F. angustifolia* Torr., a species which, in Texas, occurs only much farther west,—particularly in the trans-Pecos area of the state. My tentative identification of this Rio Grande material as *F. porulosa* was questioned by Mr. Ernest J. Palmer who had referred it to *F. angustifolia*. During subsequent correspondence between us it was agreed that we were both wrong in our tentative identifications, and that the species was undescribed.

Forestiera texana sp. nov. Arbor 2.5–4 m. altus, glaber, cortice griseo, ramulis gracilibus, haud rigidis; foliis saepissime oppositis, fasciculatis, paribus raro vel 2-paribus, oblongis, elliptico-oblongis ad ellipticis, apicibus rotundatis, cuneatis vel basibus rotundatis, brevipetiolatis subsessilibusve, ad 5 cm. longis, 9 mm. latis, saepissime 2.5 cm. longis vel minoribus, 6 mm. latis vel arctioribus, auctumno multo longioribus latioribusque quam vere, lamina subtus porulosa manifeste 1-nervia, utrinque pallide viride; pedicellis plerumque 4–5 mm. longis; fructo oblongo, saepius recurvo, acutato, stylo gracili terminato, 1 mm. longo vel breviore; nucula oblonga pluricostulata, basi truncata, saepius curva, apice acutata, ad 8 mm. longa, 2.5 mm. crassa.

Small tree 2.5–4 m. high, glabrous, with grayish bark and slender not stiff, branchlets; leaves chiefly opposite, scarcely fasciculate, occurring in pairs or infrequently with the pairs doubled, oblong, elliptic-oblong to elliptic, rounded at the apices, cuneate to rounded at bases, short-petioled to subsessile, up to 5 cm. long and 9 mm. broad, but mostly 2.5 cm. long or less and 6 mm. or less broad, being both much longer and much broader late in the season than in early spring, the under surface porulose and conspicuously 1-nerved, both surfaces light green; pedicels mostly 4–5 mm. long; fruit oblong, usually curved, acute, tipped with a slender style which is 1 mm. long or somewhat more; nutlet oblong, many-ribbed, truncate at the base, usually curved, acute at the apex, up to 8 mm. long and 2.5 mm. broad.

Type. Nine miles south southeast of La Feria, Cameron County, Texas, April 4, 1938, Cory 28393 (Arnold Arboretum, Harvard University; isotype, Tracy Herbarium of A. and M. College of Texas, College Station).

Other specimens seen. Texas: Brownsville, Cameron County, April 4, 1938, Cory 28293; southwest of Donna, Hidalgo County, November 13, 1940, Cory 36273; La Joya, Hidalgo County, August 24, 1943, Mrs. E. J. Walker (Cory 43015).

All of these specimens have been studied carefully and com-

pared with typical *F. angustifolia* collected at the San Felipe Country Club of Del Rio, Val Verde County, Texas, in May, 1943 (*Cory 41729*). The writer has seen *F. texana* growing only in Cameron and Hidalgo counties, both localities being rather remote from the range of *F. angustifolia*. Certain contrasting characters of these two species are given in the following table:

	<i>F. texana</i>	<i>F. angustifolia</i>
Habit	Moderately branched small tree	Densely branched bush or shrub
Bark	Grayish or pale	Dark to almost black
Branchlets	Elongate, slender, not stiff	Short, stout, stiff
Foliage	Pale green	Dark green
Leaves	Averaging about 20×4 mm., comparatively broad, not fasciculate	Averaging about 10×1.5 mm., comparatively narrow, fasciculate in clusters of 2 to 6.
Pedicels	4–5 mm. long	2 mm. long or less
Nutlets	Slender, acute, $6-8 \times 2.5$ mm.	Stout, rounded, 6×3 mm.

Among specimens borrowed from the Arnold Arboretum, Harvard University, all of which had been identified tentatively as *F. angustifolia*, were five which appeared closely related to *F. texana*. One of these specimens (collected January 25, 1934, in Zapata County, Texas, *Elzada U. Clover 1685*) in sparse foliage only, the leaves are almost linear, up to 4 cm. long and 3 mm. broad, and somewhat acute at the apices instead of being broadly rounded. This specimen appears to merit distinction as a variety or form under *F. texana*, but more ample material is needed before any decision can be reached. The other four specimens, it seems to the writer, represent an entity worthy of description at this time as a variety of *F. texana*. Because of the close association of Ernest J. Palmer in the collection and study of this material, I take pleasure in dedicating this variety in his honor.

FORESTIERA TEXANA var. *Palmeri* var. nov. A forma typica differt foliis confertioribus, brevioribus, arctioribus, verticillatim dispositis; folio hujus varietatis typico 1.5 cm. longo, vix vel haud 3 mm. lato; fructu cum formae typicae congruit.

This variety differs from the species in its denser foliage and its shorter and narrower leaves averaging 15 mm. in length and less than 3 mm. in breadth and usually borne in clusters; fruit similar to that of the species.

Type. Val Verde County, Texas, June 29, 1917, *Palmer 12372* (Arnold Arboretum).

Other specimens seen. Texas. La Salle County, March 17, 1917, *Palmer 11307*; Uvalde County, June 20, 1917, *Palmer 12319a*; Live Oak County, July 11, 1935, *H. B. Parks (Cory 14885)*.

The remaining specimens borrowed from the Herbarium of the Arnold Arboretum seem to be distinct from each other and from the species and varieties already described. Rather than to propose naming these as new, I prefer to give only collection data

and brief descriptions in the hope that subsequently either I or other collectors will have an opportunity to make adequate studies to determine their status.

1. Brewster County, Texas: shearing pens, Chisos Mountains, July 12, 1932, C. H. Mueller. This material lacks fruit, but there is some similarity in size and arrangement of leaves to *F. angustifolia*, from which this specimen differs in its grayish bark and foliage, in its greater density of foliage, and in its leaves all being cuneate at their bases, and in their upper surfaces being minutely hirtellous.

2. Maverick County, Texas: Eagle Pass, V. Havard. In all probability this specimen was collected prior to 1885. It has more nearly the foliage of *F. angustifolia* than of *F. texana*. I have seen it in the vicinity of Eagle Pass, but since the plants were regarded as being the former species they received no special attention. Plant a shrub; bark light to dark brown; leaves cuneate-oblong, obtuse, 10–18 mm. long, 1–2 mm. broad, more or less fasciculate, glabrous, subsessile; fruit oblong, about 6 mm. long and 4 mm. thick; nutlet relatively short and thick, about 5 mm. long and 3 mm. thick, rounded at base, blunt at apex, concavo-convex in one profile and at right angles thereto somewhat ovate.

3. Cameron County, Texas: Point Isabel (now Port Isabel), April 8, 1931, Susan Delano McKelvey 1779. This differs from all other material of this study in its small, subglobose fruit. Bark grayish; branchlets slender; foliage dense; leaves oblong-cuneate, 1–2 cm. long, 3–4.5 mm. broad, mostly in clusters of 2 to 4, glabrous, short-petiolate, porulose; fruit subglobose, about 4 mm. in diameter, borne on a pedicel 4–4.5 mm. long; nutlet plump, somewhat longer than broad, one face flattened, both ends broadly rounded, less than 4 mm. long and about 3 mm. thick.

4. Mexico: San Miguel, April 14, 1887, C. S. Sargent. It is likely that the locality is San Miguel el Grande in Central Mexico, 40 miles west of Guanajuato. The foliage in this species is similar to that of *F. angustifolia*, but its short, ovoid fruits differ from those in all of the other material in this study. Fruiting branches sparingly leafy; leaves 10–15 mm. long and 2–3 mm. broad, glabrous, spatulate, cuneate, porulose, usually borne in clusters of two or more; fruit ovoid, about 5 mm. long and 4 mm. thick, borne singly or in clusters of 2 to 4, on pedicels 3–4.5 mm. long; nutlet short and broad, ovoid, about 4 mm. long and 3 mm. thick.

With the exception of the specimens referred to *F. texana* var. *Palmeri*, all of the material from Texas seen in this study comes from along the Rio Grande. This complex of forms or species apparently stems from a center somewhere in Northern Mexico and its distributional and variational pattern affords opportunity for an interesting study.

I wish to express grateful appreciation to the following members of the Arnold Arboretum staff,—to Dr. A. C. Smith, Curator of the Herbarium, for the loan of specimens, to Mr. Ernest J. Palmer for reviewing my study, and to Dr. Leon Croizat for valuable assistance given me in the preparation of the Latin descriptions in this manuscript. I wish, also, to express gratitude to Mrs. E. J. Walker of La Joya, Hidalgo County, for the excellent material of *Forestiera texana* which she sent to me.

Texas Agricultural Experiment Station,
Substation 14, Sonora, Texas,
March, 1944.

REVIEWS

The Flowering Plants and Ferns of Mount Diablo, California. By MARY L. BOWERMAN. Pp. xi + 290, frontis. + 26 figs. Gillick Press, Berkeley, California, 1944. \$3.75.

Miss Bowerman's intensive survey of the flora of the Mount Diablo region of central coastal California is divided into two sections: first, an introductory discussion dealing with physical factors, concepts and descriptions of plant communities, and floristic relations, and second, an annotated catalogue of the vascular plants.

The catalogue constitutes the main contribution of Miss Bowerman's book. The accounts of species contain data on habitat, altitudinal range, abundance, period of blooming, associates, and local distribution. Keys to families, genera, and species are included, as are also bibliography, glossary, and index. To an ecologist interested in plant-animal interrelations, this catalogue is the best kind of guide to a local flora and provides sound groundwork for evaluation of such interrelations. Those accounts dealing with dominant species, such as the oaks, are especially significant. The factual information appears clearly set forth and constitutes a valuable storehouse of data for plant geographers and systematists.

Attention is here directed to the section of Miss Bowerman's book dealing with ecological aspects of the vegetation, occupying pages 17 to 63, and consisting chiefly of descriptions of plant aggregations of several orders, listed as formations, associations, and societies, together with observations on succession in woodland, grassland, and chaparral. These descriptions and observations are relatively brief and entirely qualitative; they are thus of a preliminary character. Commendable reserve is shown in the treatment of this section, as, for instance, in the use of only the three community terms mentioned above without any attempt to distinguish successional from climax units. Further, the author points out that plant communities of the Coast Ranges are unusu-

ally variable and that "many areas need to be described before synthesis into larger groups can be satisfactorily completed." I share the author's opinion that ecological investigation of Californian vegetation has lagged, and my own comments are an attempt to reinforce and extend the many interesting questions brought up by her survey of the plant communities of Mount Diablo.

To analyze any plant-animal community and its present-day as well as historical relations, investigators are obliged to sample it at many points and to evaluate the contents of all areas occupied by the community in terms of its distributional metropolis. How, for instance, does the *Quercus agrifolia-Aesculus* Association of Bowerman fit into the larger picture of the broad sclerophyll formation along the coast from Mendocino County south at least to Los Angeles County? Bowerman's main discussion is understandably confined to the Mount Diablo region, but at times this needs emphasis. Thus, she rejects Cooper's designation of the *Quercus agrifolia-Arbutus* Association and states (p. 22) that "*Aesculus . . .* is more characteristic than *Arbutus Menziesii*." She means, of course, that this is true in the Mount Diablo region. If we refer to Cooper (Carnegie Inst. Publ. 319, 1922: 23), we find him quite cognizant of variance: "The characteristic tree is *Quercus agrifolia*. *Arbutus . . .* is next in importance, but varies greatly in abundance in different localities. *Aesculus . . .* is usually prominent, and *Umbellularia . . .* is equally so." (Italics mine.) I cite this as a fairly typical example of the futile sort of disagreement that appears in papers dealing with community ecology. Each investigator's ideas, impressions, and conclusions are of course colored by the area with which he is most familiar; obviously, what is strikingly true in a local portion of one association may or may not be true over the remaining geographic area of that association. Yet this is overlooked. Miss Bowerman's association may represent a faciation in the larger unit of Cooper.

Other questions come up concerning the community units: (1) The occurrence of *Pinus Coulteri* on Mount Diablo is marginal; its plant associates are in part drawn from, for instance, the *Quercus agrifolia-Aesculus* Association. Just what the status of this pine community is in relation to the main geographic area of *P. Coulteri* still remains to be determined. One wonders whether the patch of Coulter pines on Mount Diablo, relatively insignificant from a strictly ecological point of view, should rank there as an association. (2) Bowerman recognizes a broad sclerophyll formation and a deciduous oak-conifer formation. Shall we add a third equivalent unit from the Californian flora, a broad sclerophyll-conifer formation, such as occurs on the eastern slopes of the Sierra Nevada in Inyo County? These seem to me more logically lumped into one woodland formation. The author's own placement of the *Quercus Wislizenii* Association into the deciduous oak-

conifer formation (p. 27) is a sample of the sort of inconsistency that results when several woodland formations are recognized. The fundamental question here concerns the concept of formation, and admittedly this is not clarified easily using as an example the woodland which, in its climax form, contains narrow sclerophylls, broad sclerophylls, and deciduous species. (3) When the author states (p. 20) that "associations . . . differ from each other floristically," she surely means this only in a partial sense, as the associations of, for instance, the chaparral formation differ ecologically as well.

We may profitably ask ourselves, what in the last analysis does the plant ecologist investigate? From one point of view, the answer is growth-form or life-form. Investigations may be directed toward descriptions, factor relations, community interrelations, or succession, but whatever the approach, it seems to me that mainly we study the vegetational mass, the physiological character of its dominant and subordinate species, and the environmental forces leading to particular responses as reflected in life-form. Miss Bowerman suggests this point of view when, in discussing indicator species (p. 17), she states that "even more important than the actual species is the facies of the vegetation." To differentiate kinds of vegetation in terms of facies, or physiognomy, we have used the concept of formation. Underlying this concept are three important considerations: dominant life-forms of the vegetation, their reflection of the nature of habitat, and their influence on the nature of interspecific relations—all obviously fundamental considerations. It is therefore surprising to read here (p. 19), as part of a general discussion of distributional units, that "in some areas the life-zone [or climatic zone] may represent a more fundamental unit than the formation." On Mount Diablo, Miss Bowerman finds the climate fairly uniform; she emphasizes that there physiographic factors strongly influence the vegetation. But to argue that "the placing of woodland, grassland, and chaparral [all present on Mount Diablo] into different formations separates them artificially" seems to me to confuse the reader as to the bases of plant-ecological inquiry. The fact that three different formations occur within one climatic zone is no argument for minimizing the significance of the concept of formation. If in the course of the complex history of Californian vegetation one climatic zone comes to support such diverse, dominant, and apparently climax plant types, we have a situation which offers an exceptional challenge for analysis; we cannot dispose of it by simply applying the term "Upper Sonoran Zone."

Only brief comment can be added on one other problem of a general character touched upon by Miss Bowerman: A discussion of indicator species (p. 17) closes with the interesting statement that "Transition[-Zone] species are not associated one with another on Mount Diablo, nor are they confined to one part of the

mountain." Californian botanists have long been concerned with "indicator" species, and critical analyses such as Miss Bowerman's may place this concept into better perspective among fundamental problems of ecology.

Especially to those familiar with the Californian flora, Miss Bowerman's descriptions and discussions of Mount Diablo plant communities should prove provocative. This part of her work augments the value of the catalogue and floristic analysis. The book is attractively printed and bound; the photographs are well reproduced. Altogether Miss Bowerman's work represents an important, useful contribution, the merits of which will be appreciated increasingly as other local Pacific Coast floras are analyzed and correlated.—FRANK A. PITELKA, Museum of Vertebrate Zoology, University of California, Berkeley.

NOTES AND NEWS

TWO CARICES NEW TO MONTANA. Two sedges collected in 1941 in the Vigilante Experimental Range, Madison County, Montana, a branch of the Northern Rocky Mountain Forest Range and Experiment Station of the United States Forest Service, were identified by F. J. Hermann who suggested that they were new to Montana. Specimens herein cited are filed both in the United States Forest Service Herbarium in Washington, D. C., and in the United States National Arboretum Herbarium, Bureau of Plant Industry, Soils and Agricultural Engineering, Beltsville, Maryland.

CAREX EBENEA Rydb., according to Mackenzie (Cyperaceae, in North American Flora 18: 1-472. 1931-1935), occurs in "mountain meadows, Wyoming to Utah, and southward to New Mexico and Arizona." The type was collected on Pike's Peak, Colorado. The Montana specimens were collected in moist "springy" muck in a mountain meadow at 8000 feet elevation, approximately 1500 feet below true climatic timberline (*Lemon and Evanko PL-120*). Plants 1.5 to 2.5 dm. tall were relatively common here and flowered in June.

CAREX EPAPILLOSA Mackenzie is given (op. cit.) as occurring in "mountain meadows, Wyoming to Washington, and southward to Utah and California." The type was collected in Utah. The Montana specimens were collected at 9000 feet elevation, about 500 feet below true climatic timberline, in moderately moist, gravelly loam in subalpine grassland (*Lemon PL-162*). Plants 3 to 6 dm. in height flowered in July. This species was associated with *Festuca idahoensis* Elmer and species of *Sieversia*.—PAUL C. LEMON, Appalachian Forest Experiment Station, United States Forest Service.

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ERRATA

- Page 59, line 40: for *Harvardi* read *Havardi*.
Page 67: delete lines 28 and 29.
Page 81, line 22: for *angustifolia* read *angustifolia*.
Page 82, line 28: for *Navarratia* read *Navarretia*.
Page 142, line 38: for *Bulb with rice-grain bulblets* read *Bulb of several scales*.
Page 142, line 41: for *Bulb of several scales* read *Bulb with rice-grain bulblets*.
Page 148, line 45 and throughout paper: for *folcata* read *falcata*.
Page 151, symbol for *Fritillaria recurva* var. *coccinea* should be an open tri-
angle instead of a solid triangle.